

CLAIMS

1.-18. (Canceled).

19. (Currently Amended) A method for high rate oxide chemical mechanical planarization of a film comprising a dielectric material, the method comprising the steps of:

i) providing a substrate having a surface and providing a polishing pad, said surface having a film of dielectric material and being in movable contact with the polishing pad;

ii) providing between said surface and said polishing pad a composition for ~~oxide dielectric material~~ chemical mechanical planarization comprising a) an abrasive; b) a fluoride salt; and c) between 0.005% and 0.03% of an acetylenic alcohol comprising at least two hydroxyl substituents; and

iii) polishing the substrate at a high rate with the composition to effect at least partial planarization of the dielectric material film.

20. (Previously presented) The method of claim 19 wherein the fluoride salt is present in an amount between 0.005 weight percent up to about 0.1 weight percent, and the abrasive comprises silica in an amount between 10% and 35% by weight based on the weight of the composition.

21. (Currently amended) The method of claim 19 wherein the dielectric material is silicon ~~dioxide~~ oxide, the abrasive comprises silica, and the removal rate of the silicon ~~oxide-dioxide~~ is at least 3983 ~~3707~~ angstroms per minute.

22. (Previously presented) The method of claim 19 wherein the fluoride salt is present in an amount of about 0.004%

23. (Currently amended) The method of claim 19 wherein the dielectric material ~~substrate surface~~ consists of a film of silicon oxide.

24. (Previously presented) The method of claim 19 wherein the substrate surface comprises a film of low-k material having a dielectric constant less than 3.3.
25. (Previously presented) The method of claim 19 wherein the substrate is a film of silicon oxide having silicon nitride features thereon.
26. (Previously presented) The method of claim 19 wherein the substrate is a film formed from plasma enhanced tetraethoxysilane.
27. (Previously presented) The method of claim 19 wherein the acetylenic alcohol of the composition is 2,4,7,9-tetramethyl-5-decyn-4,7-diol.
28. (Previously presented) The method of claim 19 wherein the acetylenic alcohol of the composition is a C₄-C₂₂ alkyne.
29. (Previously presented) The method of claim 28 wherein the acetylenic alcohol of the composition is a C₁₂-C₁₆ alkyne.
30. (Previously presented) The method of claim 19 wherein the abrasive is colloidal silica.
31. (Previously presented) The method of claim 19 wherein the composition is free of oxidizing agents.
- 32-33. (Canceled)
34. (New) The method of claim 19 wherein the composition when used to polish an oxide formed from plasma-enhanced deposition of tetraethoxy silane provides an oxide removal rate of at least 3983 angstroms per minute.

35. (New) The method of claim 19 wherein the composition, when supplied at a rate of 170 ml/minute to polish an oxide formed from plasma-enhanced deposition of tetraethoxy silane under polishing conditions of 7 psi downforce, 75 RPM platen speed, 70 RPM carrier speed, and 1 psi back pressure, provides an oxide removal rate of at least 3983 angstroms per minute.

36. (New) The method of claim 19 wherein the composition, when supplied at a rate of 170 ml/minute to polish an oxide formed from plasma-enhanced deposition of tetraethoxy silane under polishing conditions of 7 psi downforce, 75 RPM platen speed, 70 RPM carrier speed, and 1 psi back pressure provides after polishing a defect count measured by laser beam scattering at 0.13 microns resolution of 134 or less defects per wafer.

37. (New) The method of claim 19 wherein the abrasive is colloidal silica, and the dielectric material removal rate is at least 3983 angstroms per minute.

38. (New) The method of claim 19 wherein the dielectric material is an oxide formed from plasma-enhanced deposition of tetraethoxy silane , and after polishing and washing the wafer in a 1% HF solution a defect count measured by laser beam scattering at 0.13 microns resolution is 1632 or less defects per wafer.

39. (New) The method of claim 19 wherein the abrasive consists essentially of colloidal silica.

40. (New) A method for oxide chemical mechanical planarization of a film comprising a dielectric material, the method comprising the steps of:

- i) providing a substrate having a surface and providing a polishing pad, said surface comprising a film of dielectric material being in movable contact with the polishing pad;

- ii) providing between said surface and said polishing pad a composition for dielectric material chemical mechanical planarization consisting essentially of a) a

silica abrasive; b) a fluoride salt; c) an acetylenic alcohol comprising at least two hydroxyl substituents; and d) water; and

iii) polishing the substrate with the composition to effect at least partial planarization of the film of dielectric material.

41. (New) The method of claim 40 wherein the composition is free of oxidizing agents.

42. (New) The method of claim 40 wherein the composition consists of a silica abrasive; b) a fluoride salt; and c) an acetylenic alcohol comprising at least two hydroxyl substituents.

43. (New) The method of claim 40 wherein the composition when used to polish an oxide formed from plasma-enhanced deposition of tetraethoxy silane provides an oxide removal rate of at least 3983 angstroms per minute.

44. (New) The method of claim 40 wherein the composition, when supplied at a rate of 170 ml/minute to polish an oxide formed from plasma-enhanced deposition of tetraethoxy silane under conditions of 7 psi downforce, 75 RPM platen speed, 70 RPM carrier speed, and 1 psi back pressure, provides an oxide removal rate of about 3983 angstroms per minute or higher.

45. (New) The method of claim 40 wherein the dielectric material removal rate is at least 3983 angstroms per minute composition.

46. (New) The method of claim 40 wherein the dielectric material is an oxide formed from plasma-enhanced deposition of tetraethoxy silane, and after polishing and washing the wafer in a 1% HF solution a defect count measured by laser beam scattering at 0.13 microns resolution is 1632 or less defects per wafer.

47. (New) A method for high rate oxide chemical mechanical planarization of a film comprising a dielectric material, the method comprising the steps of:

i) providing a substrate having a surface and providing a polishing pad, said surface having a film of a dielectric silica oxide and being in movable contact with the polishing pad;

ii) providing between said film of dielectric silica oxide and said polishing pad a composition for dielectric material chemical mechanical planarization comprising a) an abrasive; b) a fluoride salt; and c) between 0.005% and 0.03% of an acetylenic alcohol comprising at least two hydroxyl substituents; and

iii) polishing the dielectric silica oxide at rate of at least 3983 angstroms per minute, wherein after polishing if the wafer is rinsed for 2 minutes in a 1% HF solution a defect count after rinsing as measured by laser beam scattering at 0.13 microns resolution is 1632 or less defects per wafer.